Ontario

In-Line Degreasing with Steam

"BayForm is a responsible member of the community and is concerned about operating in an environmentally friendly fashion. When the idea was brought forward of using steam instead of an expensive and hazardous chemical in our degreasing process, we proceeded with enthusiasm. The result has been savings in energy and chemicals, and a safer and healthier work place.

The project has lived up to our expectations as a win-win situation."

Randy Clarke
Plant Manager
BayForm Division of Bay Mills Ltd.
Weston, Ontario

BayForm plant in Weston, Ontario..

THE COMPANY

BayForm is a metal fabricating company that specializes in a roll-forming product for the window industry. Bayform is one of the largest suppliers of this product and employs more than 100 people at its plant in Weston, Ontario.

THE CHALLENGE

Using induction welding to produce tubing from light gauge metal as it comes off the rolling mill generates significant heat at the weld point. The weld point must be flood-cooled to preserve the tooling around it. However, the cooling lubricants and oil deposited on the metal from the aluminum rolling mills contaminate the tubing. They both must be removed from the finished product in a process called degreasing.

Conventionally, degreasing is done with trichloroethylene vapor. However, this process uses large amounts of electrical energy to heat and vaporize the trichloroethylene, and then to distill and recover it afterwards for recycling. Trichloroethylene is also costly and hazardous to the environment.

THE SOLUTION

Bayform tried many alternatives to the trichloroethylene system during a four-year period. Any new method had to clean the tubing to a standard of less than 100 ppm of volatiles and the product had to dry quickly so that it could be packaged without delay. The new method also had to be safer for the environment and for the health and safety of company employees.

In August 1993 these goals were met with the introduction of an in-line steam degreasing system to replace the trichloroethylene method. Steam degreasing promised to be an effective and cheaper way to clean the metal tubing.

THE TECHNOLOGY

In Bayform's operation, each roll-forming and induction welding production line is equipped with its own steam degreasing system. In each degreasing system, a gas-fired, high-pressure tube boiler is supplied with water that has been pre-treated with water softeners to prevent excessive build-up of mineral deposits in the boiler. The inside temperature of the steam cleaning cabinet is maintained at approximately 180 degrees F (82° C). After cleaning, the dry product leaves the machine and is ready for packaging.

RESULTS

The steam cleaning process is able to effectively clean the product to the desired level of less than 100 ppm of volatiles and dry the product quickly enough so that it can be packaged immediately. During a three-month trial period, the process yielded better than anticipated savings in both cleaning costs and energy consumption. Based on this trial period and projected annual production, a simple payback of less than one year is anticipated.

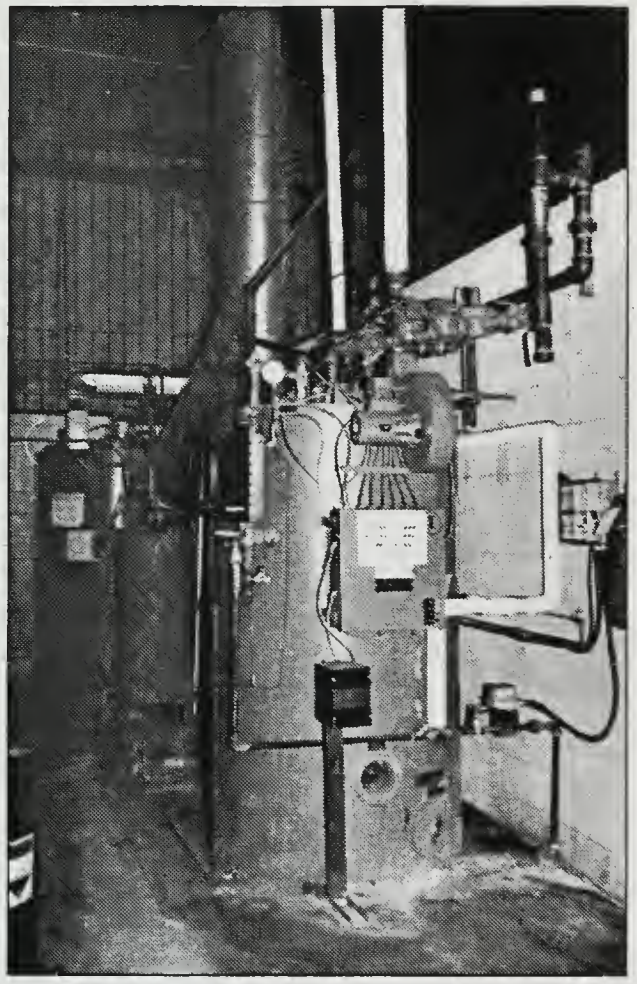
BENEFITS

The in-line steam degreasing system promises the following benefits:

* improved productivity and product quality;
* reduced use of electrical energy, estimated at 0.016 GJ (gigajoules) per 1,000 ft. of product;
* elimination of the need for more than 90 tonnes of trichloroethylene per year;
* improved environmental performance

FINANCIAL

The net cost of the system was $96,810. The annual savings, which are estimated at $118,000, will result in a simple payback time of about 10 months.



Fulton Boiler.

PARTNERSHIP IN POLLUTION PREVENTION AND RESOURCE CONSERVATION

Industrial companies located in Ontario may seek ministry/industry services which will help them to:

* use energy and water more efficiently;
* reduce, reuse and recycle solid waste;
* reduce or eliminate liquid effluent and gaseous emissions.

Equipment and services supply companies can benefit from the information provided on technologies identified for business development

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MINISTRY OF ENVIRONMENT AND ENERGY SERVICES

For information on Ministry of Environment and Energy assistance to industry, please contact the Industry Conservation Branch at (416) 327-1492, Fax (416) 327-1261.

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